Notice of Allowability	Application No.	Applicant(s)	
	10/773,017	LU, JOSEPH Z.	
	Examiner	Art Unit	
	SUZANNE LO	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *01/30/08*.

2. ☒ The allowed claim(s) is/are *1-6, 8-28*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 11/19/07
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Agent of Record Anthony Miologos (Reg. No. 29,677) on 02/14/08.

Please replace paragraph [0001] with the following:

[0001] This patent application is related to U.S. patent application Ser. No. 10/772,971 entitled "APPARATUS AND METHOD FOR MODELING RELATIONSHIPS BETWEEN SIGNALS" [Attorney Docket No. 120 06799 US] filed on February 5, 2005, which is incorporated by reference.

2. The following is an examiner's statement of reasons for allowance:

. Applicants are disclosing a method, apparatus, and system for receiving a matrix comprising two sets of a plurality of samples associated with a signal and disturbance and projecting the matrix to partially isolate a signal from a disturbance. This has been disclosed in the prior art of record.

The prior art of record does not disclose the method, apparatus, and system wherein the matrix comprises (i) a first column Hankel matrix comprising the first plurality of samples in a first portion of the matrix and (ii) a second column Hankel matrix comprising the second plurality of samples in a second portion of the matrix; and wherein *the first column Hankel matrix comprises one of a backward column Hankel matrix and a forward column Hankel matrix, and the second column Hankel matrix comprises one of a backward column Hankel matrix and a forward column Hankel matrix.*

The Examiner has interpreted a forward column Hankel matrix as disclosed in the Specification of the Instant Application paragraph [0038]:

In this example, the matrix 300 represents a "column Hankel matrix." In this type of matrix, the matrix includes a time series of samples 302 in the horizontal direction 304 (left to right) and a time series of samples 302 in the vertical direction 306 (top to bottom). Because the samples 302 in the horizontal direction 304 form a time series in the left-to-right direction, the matrix 300 represents a "forward" column Hankel matrix.

The Examiner has interpreted a backward column Hankel matrix as disclosed in the Specification of the Instant Application paragraph [0039]:

A different matrix 330 is shown in FIG. 3B, which contains samples 332 of the input signal 104. Each row includes k samples, and each column includes n-(k+1) samples. As with the matrix 300 in FIG. 3A, the matrix 330 in FIG. 3B represents a column Hankel matrix. The matrix 330 includes a time series of samples 332 in the horizontal direction 334 and a time series of samples 332 in the vertical direction 336. However, the samples 332 in the matrix 330 represent a time series of samples 332 in the opposite horizontal direction 334 (right to left), so the matrix 330 represents a "backward" column Hankel matrix.

The closest prior art uncovered during examination teaches certain limitations of the claimed invention as follows:

"Detection and multichannel SVD-based filtering of trigeminal somatosensory evoked potentials", Swinnen et al., Discloses a matrix that comprises a first column Hankel matrix comprising a first plurality of samples in a first portion of the matrix and a second column Hankel matrix comprising a second plurality of samples in a second portion of the matrix **(page 302, 2nd column, "Concatenate the K Hankel matrices...")**. However, Swinnen fails to disclose wherein the first column Hankel matrix

comprises one of a backward column Hankel matrix and a forward column Hankel matrix, and the second column Hankel matrix comprises one of a backward column Hankel matrix and a forward column Hankel matrix.

U.S. Patent Application Publication No. 2003/0061035 A1, Kadambe, Discloses receiving a matrix comprising a first plurality of samples associated with a first signal and a second plurality of samples associated with a second signal, the second signal comprising a first portion associated with the first signal and a second portion associated with at least one disturbance **([0021], mixed signal matrix X)**; and projecting the matrix using the projected matrix to at least partially isolate the first portion of the second signal from the second portion of the second signal **([0021], estimate matrix S)** but fails to disclose the matrix comprising forward and backward Hankel matrices.

U.S. Patent Application Publication No. 2005/0015205 A1, Repucci et al., Discloses projecting a matrix into an orthogonal space by performing canonical QR-decomposition on the matrix with an orthogonal matrix and an upper triangular matrix **([0010], [0073], page 8, [0101])** but fails to disclose the matrix comprising forward and backward Hankel matrices.

The amended claims have overcome the previously raised 35 U.S.C. 101 issues. Claim 26, rejected as being directed to software, per se, has been amended reciting a controller comprising one or more hardware components as well as generating and storing a model associating the first signal and the isolated first portion of the second signal. All independent claims have been amended as well to comprise the result of generating and storing a model associating the first signal and the isolated first portion of the second signal, thus connecting a mathematical algorithm to a practical application.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SUZANNE LO whose telephone number is (571)272-5876. The examiner can normally be reached on M-F, 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571)272-2297. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Suzanne Lo
Examiner
Art Unit 2128

/SL/
02/18/08

KAMINI SHAH
SUPERVISORY PATENT EXAMINER